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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/199,836 11/24/98 ACHARYA

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EXAMINER

MMC2/0606

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ART UNIT

PAPER NUMBER

2878

DATE MAILED:

06/06/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

**Office Action Summary**

Application No.

09/199,836

Applicant(s)

ACHARYA ET AL.

Examiner

Thanh X Luu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
  2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_.
  3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: .

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 9, "the relative ratios" lack proper antecedent basis.

What does relative ratios refer to? Size? Number of elements?

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton, Jr et al (U.S. Patent 5,631,703) in view of Lu et al (U.S. Patent 5,805,217).

Regarding claims 1 and 9, Hamilton, Jr et al disclose (see Figures) a color filter array comprising a unit array having four color elements in various ratios. Hamilton, Jr et al do not disclose having green, red, blue and infrared pass filters in ratios of 4:1:1:2, respectively. Lu et al disclose (see Figure 2) various filter patterns and ratios (4:1:1,

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Figure 4B) depending on the type of scanning. It would have been obvious and require only routine skill in the art at the time the invention was made to obtain an optimal ratio of colors as claimed in the invention of Hamilton, Jr et al in view of Lu et al in order to produce a desired result. The specific color choices for the filter array is simply a matter of design choice. It would have been obvious to a person of ordinary skill in the art to choose cyan, yellow, magenta and infrared since such colors represent a well known alternate palette.

Regarding claims 2, 3, 10 and 11, neither Hamilton, Jr et al and Lu et al disclose the specific filter configuration as claimed. Lu et al do disclose various filter configurations. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to obtain an optimal filter design in the apparatus of Hamilton, Jr et al in view of Lu et al in order to obtain a desired result. Furthermore, it would require only routine skill in the art to produce notation to describe an array of color filters in mathematical form.

Regarding claim 4 and 12, Lu et al disclose (see Figure 1) an array of pixel sensors (28) responsive to electromagnetic radiation propagating through the color filter array (18), wherein a pixel sensor provides an output signal indicative of electromagnetic radiation propagating through the color filter array.

Regarding claims 5 and 13, Lu et al disclose (see Figure 1) an interpolation processor (36) for interpolating pixels values. Furthermore, it is notoriously well known in the art to interpolate by using values of neighboring or adjacent pixels. The specific

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type of interpolation is design choice and would require only routine skill in the art to choose.

Regarding claims 6 and 14, Lu et al disclose (see Figure 1) a memory storage device (38) for storing instructions.

Regarding claims 7, 8, 15 and 16, Lu et al disclose a method having (see Figure 1) an interpolation processor (36) for interpolating pixels values and a memory storage device (38). Furthermore, it is notoriously well known in the art to interpolate by using values of neighboring or adjacent pixels. Neither Hamilton, Jr et al or Lu et al disclose the specific filter configuration as claimed. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to obtain an optimal filter design in the apparatus of Hamilton, Jr et al in view of Lu et al in order to obtain a desired result. In addition, it would require only routine skill in the art to produce notation to describe an array of color filters in mathematical form.

### ***Conclusion***

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook Ham, can be reached on (703) 308-4090. The fax phone

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number for the organization where the application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl

May 31, 2000



Que T. Le  
Primary Examiner